

# Procedural

Guide for

NV2000

**Emission Software** 

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## **Support Numbers**

**WorldCom Help Desk** 

Information and Service (888) 744 -7664

**Nevada Emission Referee Facilities** 

Reno

305 Galetti Way

Reno NV 89502 (775) 684-3581

Compliance and Enforcement

Carson City (775) 684-5396

Las Vegas

2701 East Sahara

Las Vegas NV 89104 (702) 486-4981

**World Wide Analyzer Manufacturer** 

Service and Information (800) 832-7664

Occupational and Business Licensing (OLBL)

**Emissions Program** 

Carson City (775) 684-4568

Reno

305 Galetti Way

Reno, NV 89502 (775) 684-3564

Las Vegas

2701 East Sahara

Las Vegas NV 89104 (702) 496-4930

# **Station Parameters**

If	Then
Your station license status has changed and you have not received a new enrollment form.	Call Occupational and Business Licensing.
The station has a new NV2000 emission analyzer.	Call the nearest State of Nevada DMV emission referee facility.
The station needs to add or delete an emission technician.	Call the nearest State of Nevada DMV emission referee facility.
The station wishes to establish or change an ACH debit account.	Call the WorldCom help desk.

#### Introduction

This procedural guide has been prepared to help you understand the changes in the Nevada emission inspection program and explain what to do if any problems occur during an inspection.

The NV2000 program utilizes the World Wide emission analyzer and implements an On Board Diagnostics (OBD) emissions evaluation that will aid in the reduction of vehicle emissions. NV2000 software and the new OBD emissions test will also provide tighter controls on program oversight and enforcement.

Emission test results and Vehicle Inspection Report (VIR) numbers will be electronically transmitted to the State of Nevada DMV. These vehicle inspection records and performance information will be stored in a central Vehicle Inspection Database (VID). The State of Nevada DMV now provides alternative registration services to the consumer. These include online, phone, mail and emission station vehicle registration. Emission inspectors are encouraged to inform the consumer of these alternative services. It not only reduces lines in the DMV offices, but will also foster emission station customer satisfaction, however the customer must be able to use a debit or credit card to complete the transaction.

All of the World Wide emission analyzers are equipped with Vehicle Identification Number (VIN) bar code scanners. The State of Nevada DMV encourages the use of these bar code scanners but they are not error free. The emission inspector shall check the accuracy of the scanned VIN by comparing it to the VIN located on the dashboard. This will reduce the error rate and ensure rapid and accurate vehicle identification.

The emission inspector will be capable of viewing recent inspection information, for a particular vehicle for up to 90 days after the initial emission inspection. The inspector will have the option to view a vehicle's emission related technical service bulletins or emission recalls prior to the inspection.

The station manager will be able to view or print analyzer or inspector evaluation reports in order to review overall analyzer or individual inspector's test results. However, if the emission analyzer has had repairs to the computer these data may not be available. The station manager will be capable of ordering Vehicle Inspection Report (VIR) numbers automatically through the analyzer by setting up an account with WorldCom.

The State of Nevada DMV has incorporated Remote Sensing Devices (RSD) into the Inspection and Maintenance program that will be used to detect high emitting vehicles. High emitting vehicles spotted by a RSD will be required to obtain an out-of-cycle emission inspection before the vehicle is due to have an emission inspection for registration renewal. The owner has the option of going to either an emission station or the State of Nevada DMV Emission Referee Facility.

NV2000 software incorporates the new federally mandated On-Board Diagnostics (OBD) emissions test in the State of Nevada DMV's Inspection and Maintenance program. On-Board Diagnostics queries the vehicles on-board computer that evaluates vehicles during their drive cycle. A vehicle will fail the OBD emission test if there is a potential to exceed 1.5 times the standards of the Federal Test Procedure (FTP). Light duty vehicles 1996 or newer must be OBD emission tested. OBD vehicles can either pass, fail or be rejected.

The inspector is responsible that emission inspections are conducted correctly. If a vehicle fails it the emission inspection, the motorist needs to understand the cause for failure and what steps must be taken for the vehicle to comply with emission requirements. In particular, the new On-Board Diagnostics emission test may be initially confusing to the motorist. Although the OBD emission test is considered to be a more stringent test than the standard Two-Speed Idle (TSI) emission test, the results of an OBD emission test does not relate at all to the results of a TSI emission test. Emission inspectors should not compare the results of these tests.

Remember, you are the frontline representative for Nevada's clean air program. It is vitally important that you are knowledgeable about the emission program, the emission test and results, and the emission analyzer. It is especially important if you repair vehicle emission systems, your ability to accurately diagnose and correct problems is crucial to Nevada's efforts to improve its air quality.

#### **General Overview of NV2000**

#### **On-Board Diagnostics**

Light-duty vehicles 1996 model year or newer will be subject to an On-Board Diagnostic (OBD) emissions test. Until December 31, 2002 the OBD emission test will default to the TSI emission test if, for any reason, the vehicle does not pass the OBD test. On January 1, 2003, vehicles that fail the OBD emission test will have to be repaired before they can be registered; the emission test will not default to the TSI emission test after that date.

On January 1, 2003 vehicles that have incomplete monitors specific to that model year will not fail but rather will be rejected. Emission inspectors should inform the motorist that the vehicle should be driven for a week in order to complete the monitors. The number of allowable incomplete monitors for vehicles 1996 to 2000 is two (2) and the number of incomplete monitors for 2001 and newer is one (1).

2G emission inspectors will be able to utilize the emission analyzer as a diagnostic tool for vehicle repair. The analyzer has On-Board-Diagnostic capability and can be used like an OBD scan tool to access generic OBD data without having to perform a vehicle emission inspection.

#### **Vehicle Inspection Reports**

Paper certificates of compliance or Vehicle Inspection Reports (VIR) must be given to the customer as evidence of an emission test and as a receipt of payment.

There are two ways to order electronic VIR's:

- 1. Electronic VIR numbers can be ordered through the emission analyzer if the station has signed up with WorldCom to use the Automated Clearing House (ACH) debit process.
- 2. Electronic VIR numbers can be purchased at full service State of Nevada DMV offices.

After electronic VIR's are purchased, the station manager or emission inspector should perform at least two data file refreshes in order to completely and accurately complete the transaction.

#### **General Emission Inspection Information**

Department messages will be displayed after an inspector enters his access code. The inspector must print or delete the message to continue with the inspection. Messages will only be displayed once, to each inspector.

Whenever possible, the inspector shall enter the Vehicle Identification Number (VIN) using the bar code scanner. The bar code scanner is not perfect and the inspector shall verify that the scanner has recorded the correct VIN. If a bar code is not available the VIN must be entered by double manual entry (i.e., VIN has to be entered twice and both entries must match).

After the VIN is entered, the analyzer automatically contacts the Vehicle Information Database (VID) to transmit the vehicle information. If the analyzer is unable to contact the VID a second attempt will be made. If there is no contact following the second attempt, the emission test will be performed and test information will be stored on the analyzer until the next VID contact.

If a VIN match is found, vehicle information is received from the VID by the analyzer. The inspector must review the vehicle information to determine if it is correct or not. If the vehicle information is not correct, then the inspector must manually enter vehicle model, model year, ignition, exhaust, odometer, and air injection information. If any of the vehicle information received from the VID is determined to be incorrect, the inspector must manually modify the information. The inspector is responsible for verifying vehicle information on all inspections, every single time. If the VID cannot match the VIN with a vehicle that already exists in the VID, the inspector must enter all vehicle information and a message will be printed at the top of the VIR stating that the report must be presented for vehicle registration.

If any of the vehicle information received from the VID is modified, an asterisk (\*) will appear next to the modified information and a message will be printed at the top of the VIR stating that the report must be presented for vehicle registration.

The analyzer will automatically contact the VID and transmit passing test information prior to printing the VIR.

If the vehicle fails the inspection, the technician shall advise the consumer to present the VIR to the repair technician or emission inspector prior to repair or re-inspection.

#### **Analyzer Maintenance**

An emission inspector will have the ability, through the analyzer maintenance menu, to perform the following:

- Data File Refresh Allows an inspector to perform a data file refresh in order to update station, inspector or VIR number information without performing an emission inspection. To perform:
  - Select option 3. Analyzer Maintenance from the main Nevada NV2000 emission analyzer
  - Select option 6. Data File Refresh
  - Always perform two Data File Refresh to ensure complete data transfer
- Modem Serial Port Diagnostics Allows an inspector to check the operation modem and ensure that the phone line is connected and functioning prior to performing an emission inspection
  - Select option 5. Analyzer Maintenance from the main Nevada NV2000 emission analyzer
  - Select option 3. Modem Serial Port Diagnostics
- Network Communication Diagnostics Allows an inspector to check for accurate data transmission without performing an emission inspection.
  - Select option 3. Analyzer Maintenance from the main Nevada NV2000 emission analyzer
  - Select option 5. Network Diagnostics Menu from the Analyzer Maintenance menu
  - Select option 1. Network Diagnostics

#### **Station Manager**

A station manager will have the ability, through the Option 4 Station Manager's menu, to perform the following:

- Order Vehicle Inspection Report Numbers Allows the station manager to order VIR's through the analyzers. To purchase VIR numbers through the analyzer, a station must have previously signed up with WorldCom to use the ACH debit process.
  - Select option 4. Station Manager Menu.
  - Select option 2. Inspection Report Numbers Menu.
  - Select option Order Inspection Report Numbers.
  - Perform two data file refreshes.
- Print station/inspector evaluation report Allows the station manager to review the performance of the station and/or an emission inspector.
  - Select option 4. Station Manager Menu.
  - Select option 3. Station/Inspector Evaluation Report.
- Change the manager access code Allows the station manager's access code to be modified.
  - Select option 4. Station Manager Menu.
  - Select option 4. Change Manager Access Code.
- Search, retrieve and print emission test records Allows individual vehicle test records to be displayed and printed.
  - Select option 4. Station Manager Menu.
  - Select option 5. Search and Retrieve Test Records.

# **Emission Inspection Procedure and Troubleshooting Guide**

- 1. Initiate inspection on NV2000 analyzer.
- 2. Enter your inspector license number and access code.

If	Then
The analyzer does not recognize your inspector license and access code.	Go to the "Station Manager" menu and select "Data File Refresh." Return to the emission test and try the license number and access code entry again. If unsuccessful, contact the nearest State of Nevada DMV emission referee facility.
Your license has expired or had been suspended or revoked.	Contact the nearest State of Nevada DMV emission referee facility.
You do not have or have forgotten your access code.	You must bring picture identification to the nearest State of Nevada DMV emission referee facility.

- 3. Any new Department messages (Bulletins) will be displayed on screen.
- 4. Scan the VIN from the vehicle or enter it manually and check for accuracy prior to continuing the emission test.

lf	Then
You do not have a bar code scanner, the bar code scanner does not work or the vehicle does not have a bar coded VIN.	Follow the on-screen instructions for manual VIN entry.
The VIN is less than seventeen (17) characters long.	Carefully and accurately enter the VIN and follow the on-screen instructions for manual VIN entry.

6. The analyzer automatically contacts the Vehicle Information Database (VID) for vehicle file match.

If	Then
The analyzer fails to communicate with the VID.	One follow-up call will automatically occur.
The VID cannot be accessed after two attempts.	Continue inspection as usual.
Communication security violation occurs; message: "Invalid Phone Number"	Be sure that the analyzer is plugged into the correct phone line and follow the on-screen instructions and continue the inspection.
Communication security violation occurs again. Invalid unit phone # message occurs again. Contact the WorldCom help desk (800) 731-7664.	The inspection cannot continue. If the analyzer determines that the correct phone line is now being used, it will self-correct. Try the inspection again.
Lock-out occurs because of too many off-line emission tests.	Contact the nearest State of Nevada DMV emission referee facility.

- 7. After VID contact, any emission related technical service bulletins should be displayed to the inspector.
- 8. If the VIN match is successful, any failed test data, TSBs, or emission recalls will be displayed along with vehicle information.

If	Then
A vehicle match is made but the vehicle information is incorrect.	Enter the correct vehicle information and continue the inspection as usual. Inform the consumer that they may not be able to utilize alternate registration services and that they need to retain the VIR for the registration process.
If there was no VID connection	Enter the correct vehicle information and continue the inspection as usual. Inform the customer that they may need the VIR for registration purposes.

If	Then
A vehicle is not found in the VID and there is no vehicle information on the screen.	correct vehicle information and continue the inspection as usual. Inform the customer that they
	will have to go to the State of Nevada DMV offices to register the vehicle.

- 9. Perform vehicle emission inspection according to analyzer guidelines.
- 10. Upon completion of the inspection, the test results are automatically transmitted to DMV and a Vehicle Inspection Report (VIR) will be automatically printed.
- 11. Inspector should review the VIR with the motorist and alert the motorist to any special messages on the VIR and remind the motorist to hold on to the VIR until they receive a valid State of Nevada DMV vehicle registration. If the vehicle failed, the inspector should explain the reason for the failure and instruct the motorist as to what to do next.

**Test Complete!** 

# **Troubleshooting Electronic Vehicle Inspection Report Numbers**

If	Then
A station has an ACH (electronic debit) account with WorldCom and needs to purchase VIR numbers.	The station manager must access the "Station Manager Menu" and select "Purchase Report Numbers." Follow the on-screen instructions. The analyzer will contact the VID and electronically download VIR numbers into the analyzer. It is recommended that two (2) datafile refreshes be performed after the electronic purchase of VIR numbers to verify receipt of the VIR's. Print a receipt of the VIR's purchased.
A station does not have ACH account with WorldCom and needs to purchase VIR numbers.	The station may purchase VIR numbers physically at a DMV field office or mail a check or money order to the nearest full service State of Nevada DMV office. After the VIR number request is processed it is recommended that two (2) datafile refreshes be performed. Print a receipt of the VIR's purchased.
The analyzer does not indicate VIR certification number purchase or you are not sure you received VIR numbers.	<ul> <li>Select "Status Screen" in the "Analyzer Maintenance" menu. Review the screen to determine if the analyzer has received new VIR numbers.</li> <li>If you did not receive the ordered VIR's, contact the Occupational Licensing and Business Licensing or WorldCom.</li> </ul>
Analyzer locked out due to "insufficient funds."	The funds in your account were not sufficient to cover the requested transaction. Contact WorldCom.
Analyzer displays "purchase not authorized."	Contact the nearest Occupational Licensing and Business Licensing or WorldCom.

# **Troubleshooting Other NV2000 Problems**

If	Then
The bar code scanner does not scan the bar code or is inoperative.	<ul> <li>If at all possible make sure all items are kept flat while scanning.</li> <li>Try blocking the sun with your hand or a piece of paper.</li> <li>Make sure the red beam covers the entire bar code.</li> <li>Make sure the bar code is clean.</li> <li>Check all connections.</li> <li>If you don't get a read on the first try, try again.</li> <li>If the bar code is not available, manually enter VIN.</li> <li>If the bar code scanner continues to have problems, try resetting the computer.</li> <li>If the problem persists, the scanner is not working; manually enter the VIN and call the World Wide service representative.</li> </ul>
You cannot initiate the inspection.	<ul> <li>Follow the analyzers on-screen instructions.</li> <li>If the analyzer is locked out, refer to the lockout guidance on page 11 in this guide.</li> </ul>

The analyzer is out of VIR numbers.	Refer to Purchasing Electronic Vehicle Inspection Report Number section in this guide.
If	• Then
Access code problems.	<ul> <li>Be sure that the "Num Lock" key on the keyboard is on.</li> <li>Be sure that you are using the correct access code. Perform two data file refreshes.</li> <li>Do not enter the lower case letter "L" in the place of the number one or use an upper case letter "O" instead of the number zero.</li> <li>If you don't know or can't remember your access code, contact the nearest State of Nevada DMV emission referee facility.</li> </ul>
Communications problems.	<ul> <li>Follow the analyzer on-screen instructions.</li> <li>Be sure the analyzer is connected to the dedicated phone line.</li> <li>Connect a dial-tone phone the analyzer phone line to and call it to verify that the phone line is functional.</li> <li>Connect a dial-tone phone the analyzer phone line to and check for a dial tone. If you do not get a dial tone or have a unclear signal, contact your phone company. If you get a dial tone, conduct a modern test (follow the instructions on the "Communications Diagnostics Menu").</li> <li>If you still need help contact WorldCom.</li> </ul>

## A Guide to Analyzer or Inspector Lockout

The following lockouts will prohibit the Analyzer from performing a emission inspection. Lockout(s) must be cleared in order to continue with inspections.

Network Lockout	Contact
Department lockout	Emission Referee Facility
Failure to pay for Vehicle Inspection Report numbers	WorldCom or Occupational Licensing and Business
	Licensing
Too many vehicle inspections performed without	Emission Referee Facility
network access.	
Analyzer initialization data incorrect	Emission Referee Facility
Station license is expired or revoked	Emission Referee Facility

Any of the following conditions may cause the analyzer to prohibit an emission inspection from being performed. If you experience any of the conditions below, contact the appropriate party for assistance.

Analyzer Lockout	Contact
Analyzer failure	World Wide Environmental Products
Warm-up failure	World Wide Environmental Products
Gas calibration failure	World Wide Environmental Products
Cabinet tamper	Emission Referee Facility
Floppy disk failure	World Wide Environmental Products
Hard disk full or hard disk mechanism failure	World Wide Environmental Products
Oxygen sensor out of calibration	World Wide Environmental Products
Out of Vehicle Inspection Report numbers	WorldCom or Occupational Licensing and Business
	Licensing

## **RPM Pick-Up Guidance**

The World Wide emission analyzer has quite a few options when it comes to acquiring a stable RPM signal on a vehicle. The State of Nevada DMV recommends that emission inspectors try to think of all the options available before sending the customer away. A stable RPM reading can usually be obtained with the RPM pick-up devices provided as standard equipment with the World Wide emission analyzer. Too many emission inspectors go straight to the non-contact RPM pickup if plug wires are not available, ignoring the other RPM options available to them. All too often the resultant RPM signal is unsatisfactory and results in an aborted emission inspection. This leads to dissatisfaction with the emission analyzer and the emission program and leaves the customer without the necessary emission inspection.

When trying to acquire a stable RPM signal please consider these things:

- Remember to always work safely. Don't put your hands or arms in harms way and don't place probes or cords in an area of extreme heat or where moving parts may damage or destroy them.
- In order to continue with an emission inspection, you must verify a stable RPM at high and low RPM ranges. You will not be able to change or adjust the RPM sensitivity and range after the tailpipe portion of the emission inspection has been initiated.
- It is to your advantage to try hard to get a RPM signal before inconveniencing a customer and sending them away. The average time to locate a stable RPM signal at the Emissions Referee Facility is less then 5 minutes.

#### **RPM Signal Quick Reference**

When a vehicle comes in for an emission inspection check for:

- An OBDII data link connector 1996 & newer passenger vehicles and light-duty trucks. If you don't know, check the reference guide.
- An automotive manufacturer provided tachometer loop (located on the engine compartment wiring

harness).

- Accessible coil pack wires.
- Accessible fuel injector wires.
- Wiring that services the fuel injector or coil pack area.
- An igniter module Normally has a RPM signal pulse wire.
- Manufacturer specific OBDI plugs that may carry a tach signal.
- A safe location to place the non-contact probe near a spark plug, coil wire, fuel injector, wiring harness, or fuse box.
- Don't be afraid to try a few things to get a signal. An example: Try switching from "DIS" To "Four Cycle" Or possibly "Coil Over Plug" on the "Ignition Type" option to bring the signal into range.
- Don't be afraid to experiment.

Please share your information. If you find a great way to get a good tach signal on a vehicle write it down and give it to your State of Nevada DMV Emission Technician during the next audit. The State of Nevada DMV will make sure that other emission inspectors will receive this information.

#### The Details and "How to"

Best options are:

- The OBD II connector
- Red Contact pickup
  - Does the automotive manufacturer provide a tach loop? You can connect the red contact lead to a tach loop.
  - o Try the red contact lead on the wires going to an individual coil.
  - Try the red contact lead on a fuel injector harness.
  - Try the red contact lead on various harnesses in the engine compartment that may carry a tach pulse, fuel injector pulse or a coil pulse.
  - Try opening the non-contact red lead and laying it in various areas of the engine compartment.
     Sometimes you can obtain a good RPM signal with this method. Example: Volvo inline 6 on rear of valve cover.
  - o For hard to get wiring World Wide provides a green wire loop that can be wrapped around various harnesses, coil and/or injector wires and clipped with the red contact lead to obtain a tach signal.
  - Look for igniter packs on some vehicles. These igniter packs often have signal wires that can be utilized
    to get a tach signal using the red contact lead. Sometimes this also requires the use of the green
    World Wide wire loop. Example: Infinity & Nissan.
  - While trying to get a tach signal keep in mind you may need to change a "DIS" or "Coil Over Plug" vehicle to "Four-Cycle" or a "Four-Cycle" to "DIS" in order to get a correct RPM signal.
  - The signal may also be fine tuned by using the range and sensitivity adjustment bars on the World Wide RPM verification screen. Click and hold the left mouse button and drag the bar to the desired location. When the mouse button is released, wait until the RPM is stable before making any more adjustments.

#### • Non-Contact RPM tachometer

- Antenna type The "Ignition Type" selection must be set on "Four-Cycle".
- Try placing the antenna as close to a signal source as possible. This could be a spark plug, coil, fuel injector and wiring harness or fuse box. Slight movement could make a big difference in the signal pickup.
- Once the signal is obtained, it may be fine tuned by using the range and sensitivity adjustment bars on the World Wide RPM verification screen. Click and hold the left mouse button and drag the bar to the desired location. When the mouse button is released, wait until the RPM is stable before making any more adjustments.
- Make sure the area you put it in is free of moving objects and that the non-contact probe will not vibrate out of position or fall into an unsafe area of the engine compartment.
- New optional adjustable type non-contact tachometer The "Ignition Type" must be set on four cycle.
  - Try locating the probe near a good pulse source. This may be a fuel injector coil, ignition module, fuse box or wiring harness.
  - Once a signal is obtained try fine tuning the pickup by using the three position sensitivity switch on the side of the pickup and the range and/or sensitivity adjustments on your World Wide RPM verification screen. Moving the cursor to the range or sensitivity indicator, clicking the mouse and dragging the

indicator to the desired position can change the range and sensitivity.

- Be aware that by rotating the probe box or flipping it upside down you may get a signal. Try rotating 90 degrees at a time.
  - Remember: Changes in range and sensitivity do not always result in an instant change in RPM readout, give the analyzer a few seconds to respond.
- Some non traditional areas to get a RPM signal with the new optional non-contact tachometer pickup are:
  - Windshield just above the instrument cluster. Example: Nissan Maxima.
  - On top of the fuse box. **Example: BMW 735** left front with the probe sensitivity switch set to the center position and probe wiring pointing to the front of the car.
  - On top of the valve cover. Example: GM Quad Four Vehicles.

## **EDT Glossary**

ACH Debit (Automated Clearing House) The ACH debit transaction is a banking process that allows you to

authorize a debit of your account to purchase VIR numbers electronically through your Analyzer.

ANI Automatic Number Identification (technology used to identify phone number from which call

originated).

Bar Code An automatic identification technology that encodes information into an array of varying width

parallel rectangle bars and spaces. (e.g., grocery store items)

Bar Code An electronic device to read bar codes that electro-optically converts bars and spaces into

**Scanner** electrical signals.

**EDT** Electronic Data Transmission

WorldCom WORLDCOM Telecommunications Corporation, the contractor chosen by the State of Nevada

DMV to develop and maintain the new Electronic Data Transmission system.

World Wide World Wide Environmental Technologies Incorporated, the contractor chosen by the State of

Nevada DMV as the sole-source vendor of emissions analyzers.

**NV2000** State certified emission-testing and electronic data transmission system.

**TSBs** Technical Service Bulletins

VID Vehicle Information Database

VIN Vehicle Identification Number

VIR Vehicle Inspection Report